EGS I&T Technical Analysis Memorandum

To: ESDIS / Janice Smith / Code 505

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From: EGS I&T Team

Subject: Test Report for EGS Test Version SDPF to LaRC DAAC Test (EXT04TV)

1. Summary & Discussion

The purpose of this TAM is to present the results of the EGS Test Version SDPF to LaRC DAAC Interface Test (EXT04TV). While problems were encountered performing this test, this interface was eventually successfully tested. The problems are described in Section 3.0. The test was performed using the EOS Ground System (EGS) Test Version Integration and Test Procedures (Baseline), dated February 22, 1996. A copy of this document is located in the Library section of the I&T Internet WWW page a URL http://fairmont.ivv.nasa.gov/it.

The requirements verified by this test are shown in Attachment A (Requirements Verification Matrix). Fourteen requirements allocated to the I&T effort were verified by this test.

Testing was performed using ECS software version 1.02 (with failures) and version 1.03 (successfully). Two Discrepancy Reports were generated against ECS software version 1.02 during the test (DRs 45 and 46). See Attachment B for a copy of these DRs.

2. Context

EGS I&T testing was performed to verify that the interface between the SDPF and the LaRC DAAC was established in order to allow the transferring of CERES Level 0 and QuickLook Data Sets and associated ancillary data (orbit and attitude data files) from the SDPF to the LaRC DAAC.

3. Discussion

3.1 EXT04TV - SDPF to LaRC DAAC Interface Test

On March 12, a dry run of this test was attempted, but connectivity between the SDPF and the LaRC ingest server could not be established. The technician at the SDPF tried unsuccessfully to ping the ingest server (icl1sgilarc 192.107.191.69) at LaRC. It was determined the reason for not being able to ping the LaRC ingest server was due to the above IP address not being in their system. The System Admin at the SDPF added the IP address and was still unable to ping the LaRC ingest server. The M&O at LaRC unsuccessfully attempted to ping the SDPF ingest server (ddsf26f 150.144.194.103). A traceroute from the LaRC ingest server was performed to see what routers and servers were in the connection path. It was noted that the first 2 routers

appeared to be normal (i.e. connectivity was established). However, it was not clear if the entire path was successfully traced.

March 13 was again spent trying to establish connectivity between the SDPF and the LaRC ingest server. The NASA SDPF representative called and stated that they were able to ping the LaRC ingest server. The M&O at the LaRC DAAC was also able to ping the SDPF. After completing the Test Set-up portion of EXT04TV.01, the SDPF tried to authenticate into the ECS system. However, connection was not established, and since LaRC saw no evidence of the SDPF connecting to the ECS system, it was assumed that the problem was at the SDPF end.

March 14 continued testing on this interface. Multiple attempts by the SDPF to connect to the ECS system failed.

Trouble shooting continued on March 15. It was discovered that the reason for the connect failures was that the SDPF request was being sent to the LaRC ingest server (icl1sgilarc 192.107.191.69) first. It was suggested by the LaRC DAAC M&O that SDPF should try sending the authentication to the gateway process first, since that is where the actual socket connection is established. The IP address for the gateway machine was provided to SDPF and a socket connection was established. Once this was accomplished, some time was spent establishing correct user ID and password for the authentication. After establishing a correct user ID and a password, a DAN and file transfer was attempted. This yielded ftp errors for all the files, and upon inspection it was found they contained no data (file sizes were zero).

On March 18 testing continued. The reason for the files in the DAN arriving with no data was attributed to the ECS ingest system needing the entire address (ddfs26s.gsfc.nasa.gov) in the DAN in order for the ingest system to ftp the files from outside of their domain successfully. The SDPF DAN was using an alias (see DR 45 for details). After the entire SDPF IP address was entered into the local host table at LaRC, the DAN was sent again. This fixed the ftp error problem to some extent as most of the files transferred error free. However, some were still being received with errors. After talking with Nitin Vazarkar (HITS Ir1 sustaining engineering) it was discovered this was a known problem (see DR 46 for details). A fix for the SessServer was needed in order to solve this problem, so formal I&T testing was halted at this time, concluding this attempt at integrating the interface with Version 1.02 of the ECS Software.

It was decided to perform this test again after the formal delivery of the ECS Software Version 1.03 (containing the CM fixes to DR 45 and 46). Additionally, it was determined to test the ECS ingest with the SDPF sending files from more than one server (an operational possibility) during the retest.

3.2 EXT04TV Retest

On April 17, ECS Software Version 1.03 was installed at the LaRC DAAC and on May 2, I&T returned to the LaRC DAAC to retest EXT04TV. The SDPF sent over a DAN that contained LEVEL 0 data with the files residing on a single server. These files were the same files used in previous testing and were all transferred with no errors occurring. The DAN and automated FTP process worked as expected during this part of the test, verifying the fix to DR 46.

The second part of the test was to have the files spread out over several SDPF servers. This would test the interface in a more operational configuration. However, when the SDPF tried to ingest TRMM data from PACOR II to two other servers at the SDPF, they encountered some problems. These were new servers, and write permission was denied. The SDPF determined that steps to fix the problem would take a while. They recommended that testing be delayed until the next day, which effectively ended this testing session.

3.3   LaRC to SDPF Multiple Server Test

On May 16, I&T returned to the LaRC DAAC to test the ingest system with the SDPF having larger files spread out over two of the file servers at the SDPF. TRMM Quicklook data provided to the SDPF by PACOR was used for this test. The first attempt at performing the test from the new server (150.144.194.101) at the SDPF resulted in ftp errors seen at LaRC and no data being present for those files. The files that were located on the old server (150.144.194.105) came across with no errors and the data was present. After some trouble shooting, the SDPF determined that the new server's IP address needed to be added to the local host table at LaRC (same problem as DR 45).

Once HITS added the IP addresses, the DAN was sent from the SDPF again with no ftp errors occurring and all of the data present. This test was successfully repeated several times.

Based on the successful completion of this test DRs 45 and 46 have been closed.

4.   *Recommendation*

The SDPF to LaRC DAAC interface is determined to be verified, and is recommended for EGS Test Version general use.

5. *Recommended Additional Distribution*

ESDIS / Ellen Herring
ESDIS / Steve Kempler
ESDIS / Beth Pumphrey
ESDIS / David Han
HITS / Nitin Vazarkar
HITS / Bob Clinard
LaRC DAAC / Lucy Lee
LaRC DAAC / Chris Harris
EDC DAAC / John Daucsavage
EDC DAAC / Tom Kalvelage
GSFC DAAC / Chris Lynnes

6. *Attachments*

A: Requirement Verification Matrix

B: Discrepancy Reports (DRs)

Originators: Approved:

_____   _____
George Bazzell   Frank Rockwell
EGS I&T Test Conductor   EGS I&T Test Director

_____
William Bryant
EGS I&T Analyst

Attachment A - Requirement Verification Matrix

All requirements have been verified and are considered to have passed the testing.

Traceability and Verification							
Paragraph ID	**Requirement Text**	**Clarification**	**Test Case ID**	**Test Method**			
				I	**A**	**D**	**T**
DADS0130	Each DADS shall receive from the SDPF, at a minimum, the following: a. Production data (L0)	Receive TRMM (CERES & LIS) L0. Applies only to ingest and temporary storage for testing purposes only.	EXT04TV.02				X
DADS1070	The DADS shall send data check and storage status to the provider of ingest data.	IR-1: This requirement is supported as follows: IR-1 shall report errors and status to TSDIS and SDPF in support of the testing of the ingest interfaces with TSDIS and SDPF.	EXT04TV.01 EXT05.3TV				X X
DADS1380	Each DADS shall monitor data transfer between external (non-ECS) elements and the DADS.	IR-1: This requirement is supported as follows: IR-1 shall report errors and status to external elements in support of the testing of the data transfer interfaces with those elements.	EXT04TV.01				X
DADS1400	Each DADS shall notify the originating source of the need to retransmit data in the event of transmission difficulties.	Applies only to ingest of TRMM data only.	EXT04TV.01				X
EOSD1607	ECS shall receive data from near term Earth Probe missions to include the following as a minimum: a). TRMM data for temporary storage for testing purposes only.	IR-1: Applies only to ingest and temporary storage for testing purposes only (not archiving) of TRMM data.	EXT04TV.02 EXT05.01TV				X X
SDPS0110	The SDPS shall be responsible for coordination of the transfer of production and quick-look science and engineering data from SDPF.	IR-1: This requirement is supported as follows: IR-1 shall	EXT04TV.02				X

	Traceability and Verification						
Paragraph ID	**Requirement Text**	**Clarification**	**Test Case ID**	**Test Method**			
				I	**A**	**D**	**T**
		be responsible for coordination of the transfer of data from the SDPF for the purpose of testing the SDPF interface to the Ingest subsystem.					
TRMM1010	The ECS LaRC DAAC shall ingest CERES data from SDPF.		EXT04TV.02				X
TRMM1020	The SDPF to the ECS LaRC DAAC data stream shall include Level 0 and quick-look data sets.		EXT04TV.02				X
TRMM1030	The SDPF Level 0 and quick-look data sets for CERES shall contain quality and accounting information.		EXT04TV.02				X
TRMM1060	The ECS LaRC DAAC shall, after notification by SDPF, retrieve CERES Level 0 production by an agreed-upon file transfer protocol.	IR-1: For IR-1, this applies to ingest and temporary storage of data from the SDPF for testing purposes only.	EXT04TV.02				X
TRMM1080	The ECS LaRC DAAC shall acknowledge successful receipt of a CERES data set from the SDPF.		EXT04TV.02				X
TRMM1200	The ECS LaRC DAAC shall ingest predicted orbit data from the SDPF.	IR-1: This requirement is supported as follows: IR-1 shall have the capability at the LaRC DAAC, to receive data from the SDPF for the purpose of testing the ingest interface between IR-1 and the SDPF.	EXT04TV.02				X
TRMM1210	The ECS LaRC DAAC shall ingest definitive orbit data from the SDPF.	IR-1: This requirement is supported as follows: IR-1 shall have the capability at the LaRC DAAC , to receive data from the SDPF for the purpose of testing the ingest interface between IR-1 and the SDPF.	EXT04TV.02				X

Traceability and Verification							
Paragraph ID	**Requirement Text**	**Clarification**	**Test Case ID**	**Test Method**			
				I	**A**	**D**	**T**
TRMM1280	ECS shall be able to accept CERES simulated data from SDPF.	IR-1: This requirement is supported as follows: IR-1 shall have the capability to receive CERES simulated data from the SDPF for the purpose of testing the ingest interface between IR-1 and the SDPF.	EXT04TV.02				X

Attachment B - DRs

DR: SMOdr00045   Related NCR: Submitted: 960318
Status: ASSIGNED-RESOLUTION   System: ECS   Assigned-Res: 960411

 TITLE: "Ingest not getting files from SDPF"

SUBMITTAL INFORMATION   ANALYSIS INFORMATION
System: ECS   Assignee1/Org: Nitin Vazarkar
 Rel/Ver: 1.02   Phone: 301-925-0406
 Subsystem: ingest   Email: nvazarka@eos.hitc.com
 Test Phase: ground sys integ   Assignee2/Org:
 Severity: 3   Phone:
 Date found: 960315   Email:
 Site/Location: LaRC DAAC   Date due (Sev=1,2):
 Submitter: gbazzell   Analysis Summary: S/W change
 Organization: SI&T   Affects: /etc/hosts file
 Phone number: 301-982-5414   Date completed: 960326
 Email: gbb@cclink.gblt.inmet.com

RESOLUTION INFORMATION   DELIVERY INFORMATION
 Assignee/Org: Nitin Vazarkar   Rel/Ver:
 Phone: 301-925-0406   Delivery Date:
 Email: nvazarka@eos.hitc.com
 Related CCR #:
 Resolution Summary: S/W change
 Projected Del/Rel: 1.03
 Date completed: 960327

VERIFICATION INFORMATION   CLOSING INFORMATION
 Assignee/Org: Date Closed:
 Phone:
 Email:
 Date Verified:
 Version tested:
 Test Status:

************ Problem Description (for SMOdr00045) ***********
 On 3/15/96, while testing EGS I&T EXT04TV (LaRC DAAC to
 SDPF interface test) at LaRC, the ingest system was not
 getting files via FTP from the SDPF. FTP errors codes
 of 10 and 20 were seen. While the file names were
 found in the ECS TEMP_STORE directory, the file
 sizes were all zero (no data). A manual FTP did work fine.

 3/18/96 Understand from Nitin V. at HITS that the problem
 is that the SDPF is not sending the domain in the
 DAN address of where ECS is to go get the files. It is only
 sending the machine name. i.e. the .gsfc.nasa.gov is

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not in the SDPF address in the DAN. Nitin is investigating
the ICD and talking with the developer to determine the
course of action to take.

************ Analysis (for SMOdr00045) ***********
The first paragraph of the DR is really a description for DR 46 (which
describes the ftp errors).

The following analysis is for the second paragraph (domain name).

It is assumed in the ingest code that the 'DDF_FILE_SYSTEM' parameter
in the DAN PVL contains a fully qualified host name (including the
domain). SDPF DAN contain only the host names (no domain) and this was
the cause for the ftp to fail (could not connect to the specified host).

The issues of whether ICD needs update is being looked into.

Additional Analysis:

032696 11:10 AM

Received an update that SDPF will be using aliases instead of
complete (fully qualified) host names.

The ingest host will have to be configured (change /etc/hosts
file) to include these aliases.

************ Resolution (for SMOdr00045) ***********
Once the alias list is received from SDPF, the ingest host
file will be updated to include these aliases.

Will be available in future version of Ir1 (1.03).

************ Admin Comments (for SMOdr00045) ***********
Fix will be in 1.03 beta version being delivered on April 17, 1996.

************ History ************
bugs   960318 132813 Submitted to ECS by gbazzell
xddts   960326 163330 Fields modified by ckolb
xddts   960326 163521 N -> A (Assigned-Eval to Nitin Vazarkar) by ckolb
xddts   960326 163533 Enclosure "Analysis" added by Nitin Vazarkar
xddts   960327 160818 Fields modified by ckolb
xddts   960327 161106 enclosure "Analysis" edited by ckolb
xddts   960327 161234 A -> R by ckolb
xddts   960327 161303 Enclosure Resolution added by
xddts   960402 142844 R -> D (Resolution = 1.03) by
xddts   960402 142930 enclosure "Analysis" edited by ckolb
xddts   960402 143034 enclosure "Resolution" edited by ckolb

xddts   960409 100436 D -> A (Assigned-Eval to Nitin Vazarkar) by ckolb
xddts   960409 100521 A -> R by ckolb
xddts   960409 100531 Fields modified by ckolb
xddts   960409 100539 Fields modified by ckolb
xddts   960409 100913 Enclosure "Admin Comments" added by ckolb
xddts   960409 101320 enclosure "Admin Comments" edited by ckolb
xddts   960411 092240 Fields modified by ckolb
xddts   960411 092302 Fields modified by ckolb
xddts   960411 114030 Fields modified by ckolb
xddts   960411 114038 Fields modified by ckolb
xddts   960411 114144 R -> D (Resolution =) by 960402
xddts   960411 114157 D -> A by ckolb
xddts   960411 114201 A -> R by ckolb

DR: SMOdr00046   Related NCR: 1627   Submitted: 960319
Status: DELIVERED   System: ECS   Delivered: 960416

 TITLE: "Random Ingest FTP Errors"

SUBMITTAL INFORMATION	ANALYSIS INFORMATION
System: ECS	Assignee1/Org: Nitin Vazarkar
Rel/Ver: 1.02	Phone: 301-925-0406
Subsystem: Ingest	Email: nvazarka@eos.hitc.com
Test Phase: ground sys integ	Assignee2/Org:
Severity: 2	Phone:
Date found: 960318	Email:
Site/Location: LaRC	Date due (Sev=1,2): 960327
Submitter: wbryant	Analysis Summary: S/W change
Organization: SI&T	Affects: Ingest software
Phone number: 301-982-5414	Date completed: 960326
Email: wmb@cclink.gblt.inmet.com	

RESOLUTION INFORMATION	DELIVERY INFORMATION
Assignee/Org: Nitin Vazarkar	Rel/Ver: 1.03
Phone: 301-925-0406	Delivery Date: 960415
Email: nvazarka@eos.hitc.com	
Related CCR #:	
Resolution Summary: S/W change	
Projected Del/Rel: 1.03	
Date completed: 960327	

VERIFICATION INFORMATION	CLOSING INFORMATION
Assignee/Org:	Date Closed:
Phone:	
Email:	
Date Verified:	
Version tested:	
Test Status:	

************ Problem Description (for SMOdr00046) ***********
During EXT04TV SDPF - LARC Interface Testing we experienced a
 problem while trying to run an automated ingest. There were
 a random amount of ftp errors detected during this test. 7
 files with errors in the first two runs were detected and 3
 files with errors in next two runs were detected out of
 82 files. The files that contained the errors were not
 always the same.

************ Analysis (for SMOdr00046) ***********
This problem is documented in Hughes NCR 1627.

These errors are caused due to the Virtual Time Alarm signal used by
the DCE runtime on SGI. The ftp process (child) inherits this signal

from the Session Server process (parent) that starts it. Whenever it (ftp) receives the signal, it terminates.

************ Admin Comments (for SMOdr00046) ***********
Will be available in future version of Ir1 (1.03).

Fix is in 1.03 beta version "booting version".

Fix will be in 1.03 beta version being delivered on April 17, 1996.

************ Resolution (for SMOdr00046) ***********
Before starting the ftp, signal handling is modified to ignore (sigignore) the 'VT Alarm' signal. After returning from ftp, the signal handling is restored (sigrlse).

This modification affects the Session Server executable. The fix was tested during the I&T phase and also in the SDPF interface testing.

************ History ***********
bugs   960319 095606 Submitted to ECS by wbryant
xddts   960326 163614 Fields modified by ckolb
xddts   960326 163724 N -> A (Assigned-Eval to Nitin Vazarkar) by ckolb
xddts   960326 163734 Enclosure "Analysis" added by Nitin Vazarkar
xddts   960326 163820 Enclosure "Admin Comments" added by ckolb
xddts   960327 160151 enclosure "Analysis" edited by ckolb
xddts   960327 160213 Fields modified by ckolb
xddts   960327 160500 A -> R by ckolb
xddts   960327 160601 Enclosure Resolution added by
xddts   960327 160631 enclosure "Analysis" edited by ckolb
xddts   960402 143121 R -> D (Resolution = 1.03) by
xddts   960402 143129 Fields modified by ckolb
xddts   960402 143138 Fields modified by ckolb
xddts   960402 143209 enclosure "Analysis" edited by ckolb
xddts   960402 143230 enclosure "Resolution" edited by ckolb
xddts   960409 094512 D -> A (Assigned-Eval to Nitin Vazarkar) by ckolb
xddts   960409 094529 A -> R by ckolb
xddts   960409 094543 Fields modified by ckolb
xddts   960409 094553 Fields modified by ckolb
xddts   960409 094634 enclosure "Resolution" edited by ckolb
xddts   960409 094807 enclosure "Admin Comments" edited by ckolb
xddts   960409 101430 enclosure "Admin Comments" edited by ckolb
xddts   960411 092505 Fields modified by ckolb
xddts   960411 092523 Fields modified by ckolb
xddts   960416 085528 R -> D (Resolution = 1.03) by 960402